Data Source: EM CDB Report Number: GEN-01b

Operations/Field Office: Idaho

Print Date: 3/10/2000

Site Summary Level: Idaho National Engineering and Environmental Laboratory HQ ID: 0453

Project ID-WM-105 / AMWTP Production Operations

### **General Project Information**

### **Project Description Narratives**

#### Purpose, Scope, and Technical Approach:

The purpose of the Advanced Mixed Waste Treatment Project (AMWTP) is to retrieve, treat and prepare for shipment 65,000 m3 of transuranic (>100 nanocuries per gram alpha) and alpha low-level (>10 but <100 nanocuries per gram alpha) mixed waste, currently stored at the Idaho National Engineering Laboratory (INEEL) Radioactive Waste Management Complex (RWMC), for final disposal at the Waste Isolation Pilot Plant (WIPP). The procurement and construction of a mixed waste treatment facility (the Advanced Mixed Waste Treatment Facility, or AMWTF) to address this waste is identified in a Settlement Agreement between the state of Idaho, the U.S. Navy and the DOE, signed in October, 1995. In accordance with this Agreement, DOE-ID procured private sector retrieval and treatment services through a competitive bid process and awarded a fixed-price contract to BNFL Inc. on December 20, 1996. In addition to the 65,000 m3 of DOE-ID waste, the AMWTP contract provides a treatment capacity for several mixed waste streams identified in current DOE Federal Facilities Compliance Act Site Treatment Plans. The procurement of the AMWTP provides for the removal and disposition of stored TRU waste from the state of Idaho, thereby meeting the conditions of the Settlement Agreement and eliminating the need for long-term inspection and management of the waste. In addition, disposition of the waste addresses stakeholder concerns regarding the storage of radioactive waste above the Snake River Plain Aquifer, which is a primary source of drinking and irrigation water for much of southeast Idaho

The AMWTP is divided into three phases. Phase I provides for the completion of licensing, permitting and preliminary design activities, as well as an environmental impact statement (EIS)under the National Environmental Policy Act (NEPA). Phase II provides for the construction of the treatment facility and transition of RWMC retrieval and storage operations from the INEEL Management and Operating contractor to BNFL Inc. Phase III provides for the actual operation of the facility, RCRA closure following operations, and subsequent D&D of the facility. Because the AMWTP is a privatization project, the three phases are discussed in two Project Baseline Summaries (PBS). This PBS includes the activities associated with Phase I of the project, including licensing, permitting (RCRA, TSCA, NESHAPs, Idaho Air), preliminary design of the facility, and completion of a NEPA evaluation; and, 2) Phase III activities, including retrieval of 65,000 m3 of waste from an earthen-covered asphalt pad and several RCRA-permitted storage modules, excavation and disposition of 40,000 m3 of interstitial soil associated with the earthen-covered berm waste; characterization of waste in support of storage, treatment and disposal; treatment of the 65,000 m3 of waste, achieving a minimum volume reduction of 65%; preparation of the treated waste for shipment; loading TRUPACT II containers; loading containers onto approved transport carriers (DOE is responsible for actual transport of waste to WIPP); and, RCRA closure and D&D of the treatment facility and all Government Furnished Equipment (GFE) used during the project.

All of the technologies being utilized in the AMWTP have been demonstrated on similar waste-type problems and are not expected to require significant development efforts beyond those necessary for application specific to this project.

- Retrieval of the waste will employ earth-moving equipment, a high-capacity vacuum, and hands-on activities for dirt removal, and forklifts and trucks for transporting the waste to the treatment facility.
- Retreived waste will be sorted and segregated; the facility will have one sort/segregate line for boxes and one line for drums.
- Characterization (i.e., for storage, treatment and disposal) will utilize a combination of real-time radiography, non-destructive assay methods, and direct analysis of contents.

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Project ID-WM-105 / AMWTP Production Operations

## **Project Description Narratives**

- Treatment will include incineration; microencapsulation; and supercompaction followed by macroencapsulation. The type of treatment employed will depend on the physical/chemical characteristics of the retrieved waste.

#### Assumptions:

- 1. Retrieved waste will be very similar to the description provided in existing waste characterization database; treatment rates are based on the waste description provided in these databases. If the retrieved waste is appreciably different, the project may not be able to treat as much waste and overall costs could increase.
- 2. Disposal sites (i.e., WIPP) for the treated product will be available.
- 3. The AMWTP will be able to obtain the necessary permits to construct and operate the facility, in time to support STP and Settlement Agreement milestones.
- 4. Necessary privatization funding will be obtained in FY 00 through 04 to allow construction of the treatment facility.
- 5. Shipment of TRU waste to WIPP will utilize the TRUPACT.
- 6. The CAO will provide adequate and necessary resources for shipment of TRU waste to WIPP.
- 7. Projected disposal volumes are based on a volume reduction of 65% following treatment.

#### **Project Status in FY 2006:**

By 2006, Phase I of the AMWTP, including the NEPA evaluation, licensing, permitting and preliminary design, will be complete. Phase II (discussed in PBS ID-WM-104), including detailed design, construction and startup of the treatment facility, and transition of RWMC retrieval and storage operations from the M&O contractor to BNFL Inc., will be complete. Phase III, production operations, will have commenced. Approximately 30%, or 19,500 m3, of the 65,000 m3 of stored TRU waste will have been retrieved, characterized, treated, and prepared for shipment to WIPP for final disposal.

#### Post-2006 Project Scope:

The AMWTP provides for the retrieval, characterization, and treatment of sufficient quantities of waste necessary to maintain a running average of 2000 m3 of waste per year shipped out of Idaho, until the total 65,000 m3 of waste is out of the state (by December 31, 2015, but no later than December 31, 2018). The contract with BNFL Inc. includes provisions for treating additional mixed wastes from throughout the DOE Complex, and it is anticipated that other DOE sites will send mixed wastes to the facility for treatment. Following completion of all treatment, the facility will be closed in accordance with RCRA and decontaminated and decommissioned within approximately 3 years of completing facility operations.

#### **Project End State**

Completion of this project will support the EM end-state by providing for retrieval, treatment and preparation for disposal at WIPP 65,000 m3 of mixed transuranic and alpha low-level radioactive wastes currently stored at the RWMC, as well as the subsequent RCRA closure and decontamination and decommissioning (D&D) of the treatment facility and associated GFE. The facility operations associated with this project are scheduled to begin in 2003 and complete in 2015, followed by completion of the D&D of the facility by 2018. There is a provision in the contract to extend the contract life as necessary and at the discretion of DOE, to treat additional INEEL and non-INEEL DOE mixed waste at the AMWTF.

#### **Cost Baseline Comments:**

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Project ID-WM-105 / AMWTP Production Operations

## **Project Description Narratives**

The costs reflect a fixed-price, competitively-bid contract with BNFL Inc., signed December 20, 1996, with work beginning January 18, 1997, for permitting, design, construction, operation, closure and decontamination and decommissioning associated with the Advanced Mixed Waste Treatment Facility. Successful completion of the project assumes sufficient funds will be available to meet contractual requirements; failure to receive sufficent funding would require renegotiation or termination of the contract.

Because Phases I and II of the AMWTP are fixed-price, only the costs associated with Phase III of the project (which begins in FY 03) are subject to escalation. Contingency of approximately \$500k/year, based on local experience, has been included for FY 00-02, and has been escalated in accordance with DOE-HQ budget guidance.

The total current dollar project cost has not changed. Differences represent application of economic escalation and discount rates between those contractually required and those in the IDMS system. The seeded escalation rates in the IDMS system were changed by DOE-ID to reflect actual expected contract price. However, the rates do not necessarily reflect those found in the AMWTP fixed price contract. Interpolation was necessary in order to reflect accurately those anticipated prices expected to occur that are contractually binding on the government.

#### Safety & Health Hazards:

The AMWTP will provide for private sector retrieval, treatment, and repackaging of 65,000 m3 of transuranic and alpha low-level mixed wastes currently in storage at the RWMC Transuranic Storage Area (TSA). This waste resulted primarily from weapons production activities conducted at the Rocky Flats Plant and other DOE facilities and was received at the INEEL from 1970 to the late 1980s. These wastes are currently stored in drums, boxes and bins and consist of various solid materials including process sludges, nitrate salts, paper, clothing, plastic, rubber, glass, concrete and various bulk metals. The majority of the waste (approximately 80%) is located in earthen-covered storage within the TSA, with the remainder located in several RCRA-permitted storage modules at the RWMC. The principle hazards associated with this waste are radionuclides (transuranic and mixed fission products), RCRA hazardous constituents (e.g., volatile organic compounds and metals), PCBs and asbestos. Therefore, radiation exposure, personnel contamination, and chemical exposures are potential health hazards that will be present on a daily basis. Additionally, fire hazards will be a concern, along with the normal occupational hazards of lifting, tripping, falls, etc. A hazard analysis is being performed to identify all potential hazards associated with the scope of work. At the end of the project life, the facility will be decontaminated and decommissioned; thus the principal hazards will involve normal occupational hazards related to building D&D. Once D&D is complete, all hazards should be eliminated.

Because this is a privatization project, BNFL Inc. is required to submit a formal ES&H Authorization application to DOE-ID for approval prior to initiating construction/operations of the facility. The authorization basis for this project will be established through the development and approval of the ES&H Program Operating Plan (ESHPOP), a PSAR/FSAR, applicable regulatory permits (i.e., RCRA, TSCA, CAA/NESHAPs), and the projectspecific NEPA decision. The ESHPOP will identify the set of rules, regulations, statutes, DOE Directives, etc. which will govern the design, construction and operation of the AMWTF. Thus, the ESHPOP presents the integrated safety management program that will be implemented throughout the life of the project. The ESHPOP will be developed during Phase I of the project and cosigned by DOE-ID and BNFL Inc. The ESHPOP will be the basis for the formal authorization for BNFL Inc. to handle DOE radioactive materials, and will form the basis from which DOE-ID will perform ES&H oversight of BNFL Inc. activities during construction and operation of the facility. The PSAR and FSAR will identify the hazards involved in the work, and will determine the hazard mitigation necessary to complete the work safely. Appropriate design barriers will be included in facility construction, and additional administrative controls will be identifed and implemented during construction and operations to provide defense in depth for hazards. Operational testing and readiness reviews will also be conducted, prior to final startup of facility operations, to

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### **Project Description Narratives**

ensure facility operations can be performed safely.

#### Safety & Health Work Performance:

Because this is a privatization project, DOE-ID intends to conduct its monitoring of the AMWTP construction and operations using an approach analogous to a permit. This approach will be consistent with DNFSB Recommendation 95-2 and will allow DOE-ID and BNFL to mutually negotiate the terms of a document that will set out each party's expectations and limits of conduct, and will provide each party with the assurance that neither DOE not BNFL will conduct itself in a manner contrary to the terms of the document unless emergency or extraordinary conditions arise. The document will be called the ES&H Authorization and will be cosigned by DOE-ID and BNFL. Once signed, it will present the requirements from which DOE-ID will conduct oversight of ES&H for the contract and will constitute the formal authorization for BNFL to conduct operations and handle DOE radioactive materials. The ES&H Authorization will identify requirements in the following functional areas: radiological controls; nuclear criticality controls; safety analysis report and process; worker safety and health; permission to commence operations and stop work authority; facility, construction and fire safety; training and qualification; environmental protection and monitoring; contingency/emergency planning and response; records and reports; facility security; conduct of operations; radioactive waste management; hazards analysis and control.

In addition to cosigning the ES&H Authorization, prior to startup of facility construction and operations DOE-ID will review and approve the Preliminary Safety Analysis Report, the Final Safety Analysis Report, the Systems Operability Test Plan, the Systems Operability Results Reports, and the contractor's Readiness to Operate Report. In addition, DOE-ID will conduct an independent Operational Readiness Review of the BNFL facility prior to startup authorization.

Once the Authorization is approved, DOE-ID oversight of facility construction and operations will include semiannual reviews of BNFL's nuclear and radiological safety program and non-radiological occupational safety and health self-assessment program; annual audits of BNFL's nuclear and radiological safety program and non-radiological safety and health programs against the ES&H Authorization basis; and an annual surveillance of AMWTP air permit activities to ensure compliance with overall INEEL Air Permit conditions.

#### **PBS Comments:**

The AMWTP is a highly visible project within the state of Idaho as well as the DOE. It is the second largest privatization project in the DOE, and the largest at DOE-ID. The Advanced Mixed Waste Treatment Facility is identified as the facility for treatment of several mixed waste streams identified in the Site Treatment Plans (STPs) required by the Federal Facilities Compliance Act of 1992, as well as being required by the Settlement Agreement between the State of Idaho and the DOE, signed in October 1995. The Settlement Agreement identifies milestones for construction and commencement of operations at the facility, and the STPs identify milestones for treating mixed waste at the facility, thus several enforceable milestones are tied to construction and operation of this facility. Failure to meet these milestones can lead to an injunction to stop DOE spent fuel from entering the state of Idaho, and impact STP milestones under the FFCA.

#### **Baseline Validation Narrative:**

This is a Privatization project being conducted under a fixed-price contract. The project was validated through the competitive bid proces.

#### **General PBS Information**

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Project ID-WM-105 / AMWTP Production Operations

### **General PBS Information**

Project Validated? Yes Date Validated: 12/20/1996

Has Headquarters reviewed and approved project? No

**Date Project was Added:** 12/1/1997

**Baseline Submission Date:** 

FEDPLAN Project? Yes

DNFSB **CERCLA** RCRA AEA UMTRCA DOE Orders Other **Drivers:** State N Y Ν Y Y Y Y

## **Project Identification Information**

**DOE Project Manager:** Mike J. Bonkoski

DOE Project Manager Phone Number:208-526-1412DOE Project Manager Fax Number:208-526-0598

**DOE Project Manager e-mail address:**BONKOSKIMJ@INEL.GOV

Is this a High Visibility Project (Y/N): Y

## **Planning Section**

### **Baseline Costs (in thousands of dollars)**

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	134,959	342,200	477,159	1,300	1,300	7,900	7,623	8,714	527	669	549	5,600	25,700	41,300	42,700
PBS Baseline (constant 1999 dollars)	106,808	214,136	320,944	1,300	1,300	7,900	7,623	8,714	516	642	516	4,470	20,113	31,320	31,317
PBS EM Baseline (current year dollars)	134,959	342,200	477,159	1,300	1,300	7,900	7,623	8,714	527	669	549	5,600	25,700	41,300	42,700
PBS EM Baseline (constant 1999	106,808	214,136	320,944	1,300	1,300	7,900	7,623	8,714	516	642	516	4,470	20,113	31,320	31,317

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Baseline Costs (in t	thousand	ls of dolla	rs)													
	1997-200 Total	06 2007-2 Tota		-2070 otal	1997	Actual 1997		ctual 1998	1999	2000	2001	2002	2003	2004	2005	2006
dollars)																
	2007	2008	2009	2010	2011- 2015			2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS Baseline (current year dollars)	42,000	43,500	31,600	46,600	155,800	22,700	0	0	0	0	)	0 (	0	0	0	0
PBS Baseline (constant 1999 dollars)	29,762	29,782	20,863	29,783	92,789	11,157	0	0	0	0	)	0 (	0	0	0	0
PBS EM Baseline (current year dollars)	42,000	43,500	31,600	46,600	155,800	22,700	0	0	0	0	)	0 (	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	29,762	29,782	20,863	29,783	92,789	11,157	0	0	0	0	)	0 (	0	0	0	0
Baseline Escalation	n Rates															
	1997	1998	1999	2000	200	1 2002	200	3 20	004	2005	2006	2007	2008	2009		
	0.00%	0.00%	0.00%	2.10%	2.10%	6 2.10%	17.709	% 2.0	0% 3.	20%	3.40%	3.50%	3.50%	3.70%		
	2010	2011-2015	2016-2020	2021-2025	2026-2036	0 2031-2035	2036-204	0 2041-20	2046-2	2050 2	2051-2055	2056-2060	2061-2065	2066-2070		
	3.30%	2.40%	5.00%	2.10%	2.10%	6 2.10%	2.10	% 2.1	0% 2.	10%	2.10%	2.10%	2.10%	2.10%		

## **Project Reconciliation**

**Project Completion Date Changes:** 

Previously Projected End Date of Project: 12/1/2018

Current Projected End Date of Project: 12/31/2018

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Project ID-WM-105 / AMWTP Production Operations

## **Project Reconciliation**

**Explanation of Project Completion Date Difference (if applicable):** 

**Project Cost Estimates (in thousands of dollars)** 

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars): 333,372 Actual 1997 Cost: 1,300 Actual 1998 Cost: 7,623

Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars): 324,449 Inflation Adjustment (2.7% to convert 1998 to 1999 dollars): 8,760

Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): 333,209

**Project Cost Changes** 

Cost Adjustments Reconciliation Narratives

**Cost Change Due to Scope Deletions (-):** 

**Cost Reductions Due to Efficiencies (-):** 

**Cost Associated with New Scope (+):** 

Cost Growth Associated with Scope Previously Reported (+): -21,465 Use of AMWTP contract economic factors rather than OMB factors (see Cost Baseline narrative).

Cost Reductions Due to Science & Technology Efficiencies (-):

**Subtotal:** 311,744

Additional Amount to Reconcile (+):

Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): 311,744

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
BNFL COMMENCE OPERATION OF AMWTF	ID0453-4		3/31/2003	3/31/2003			Y				Y
DOE COMPLETE SHIPMENT OF 65000 M3 OF AMLL AND TRU WASTE OUT OF IDAHO	ID0453-5		12/31/2015	12/31/2015			Y				Y
COMPLETE AMWTP MOA PHASE III (OPERATIONS)	ID-WM-108-4		4/1/2002							Y	

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Project ID-WM-105 / AMWTP Production Operations

Project ID-WW-103 / AWW 11 Troduction Operations													
Milestones													
Milestone/Activity	Field Milestone Code		Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite	
DOE-HQ ISSUE NEPA ROD		ID0453-6			3/15/1999		2/28/1999						
PROJECT MISSION COMPLETE	ID0453-2			12/31/2018 1	2/31/2018			Y					
DOE-ID issues NEPA Record of I Advanced Mixed Waste Treatmen				3/1/1999						Y			
DOE-ID approves AMWTP Prelin Analysis Report.				6/15/1999						Y			
Project Start					1/20/1997								
Milestones - Part II													
Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Pat	Project n Start	•	Mission Complet		Work Scope Risk	Intersite Risk	Cancel	led	Milestone D	escription
BNFL COMMENCE OPERATION OF AMWTF	ID0453-4												
DOE COMPLETE SHIPMENT OF 65000 M3 OF AMLL AND TRU WASTE OUT OF IDAHO	ID0453-5												
COMPLETE AMWTP MOA PHASE III (OPERATIONS)	ID-WM-108-4									Y			
DOE-HQ ISSUE NEPA ROD	ID0453-6	Y											
PROJECT MISSION COMPLETE	ID0453-2				Y								
DOE-ID issues NEPA Record of Decision for Advanced Mixed										Y			

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PBS Baseline Start

Y

Y

Date of Dataset: 9/20/1999

Waste Treatment Project

DOE-ID approves AMWTP

Preliminary Safety Analysis Report.

(AMWTP).

Project Start

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Performance Measure Metrics														
Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planne 200
TRU														
Treatment	M3	19,500.00	42,104.00	61,604.00									1,000.00	4,500.0
TRU														
Storage	M3												60,604.00	56,564.0
TRU														
Ship. to WIPP	M3	5,840.00	22,903.00	28,743.00									442.00	1,530.0
MLLW														
Treatment	M3	417.35	205.67	623.02									50.73	141.7
MLLW														
Storage	M3												0.00	0.0
LLW														
Treatment	M3	0.00	0.02	0.03									0.00	0.0
LLW														
Storage	M3												0.00	0.0
Category/Subcategory	Units	Planne 200			Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	2016	202	1 - 20		anned 2031 - 2035
TRU														
Treatment TRU	M3	4,500.0	7,000.0	7,000.00	6,680.00	6,680.00	4,680.00	6,680.00	17,384.00	)				
Storage TRU	M3	56,564.0	0 50,711.0	0 44,886.00	38,948.00	32,528.00	27,728.00	21,569.00	0.00	)				
Ship. to WIPP	M3	1,530.0	0 1,948.0	1,920.00	2,212.00	2,694.00	2,190.00	2,433.00	13,374.00	)				

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Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
MLLW													
Treatment MLLW	M3	141.79	138.41	86.41	64.41	5.31	5.31	5.31	25.31	25.00	25.00	25.00	25.00
Storage LLW	M3	0.00	0.00	0.00	0.00								
Treatment LLW	M3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Storage	M3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total			
TRU													
Treatment TRU	M3									61,604.00			
Storage TRU	M3												
Ship. to WIPP MLLW	M3									28,743.00			
Treatment MLLW	M3									623.02			
Storage LLW	M3												
Treatment LLW	M3									0.03			
Storage	M3												

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Project ID-WM-105 / AMWTP Production Operations

**Technology Needs** 

Site Need Code: ID-3.1.14

**Site Need Name:** Need to Develop Waste Form Standards

Focus Area Work Package ID: MW-08 Focus Area Work Package: Facilitating Deployment for Unique Wastes

Focus Area: MWFA Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both):

Technologies Cost Savings (in thousands of dollars) Range of Estimate

 Related CCP Milestones
 Related Waste Streams
 Agree?
 Change?

 02422: DA - CH Containers (98-2015)
 Y
 N

 00814: AA - CH Containers (98-2002)
 Y
 N

 00815: AB - CH Containers (2003-2015)
 Y
 N

Site Need Code: ID-3.2.20

Site Need Name: Develop On-Line Product Characterization Methods for Thermal Treatment.

Focus Area Work Package ID: MW-01 Focus Area Work Package: Nondestructive Characterization for Treatment, Transportation, and Disposal of

MLL and MTRU Waste.

Focus Area: MWFA Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies Cost Savings (in thousands of dollars) Range of Estimate

Solutions for TRU Waste Streams without Disposition Options

Related CCP Milestones Related Waste Streams Agree? Change?

00817: CA - RFETS CH TRU Y N
00814: AA - CH Containers (98-2002) Y N

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**Technology Needs** 

Related CCP Milestones	Related Waste Streams	Agree?	<b>Change?</b>
	00815: AB - CH Containers (2003-2015)	Y	N
	00821: AG - SWEPP Reject Drums	Y	N
	02041: AAL - Sludges/Liquids-Debris-Lab Packs-HEPAs-Lead	Y	N

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